Phragmites Treatment/ Management Prioritization Tool

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Background

Coastal Wetlands

Great Lakes coastal marshes are a special type of emergent wetland. These extremely productive, and rare systems are critical to Michigan's fish, wildlife, and migratory birds.

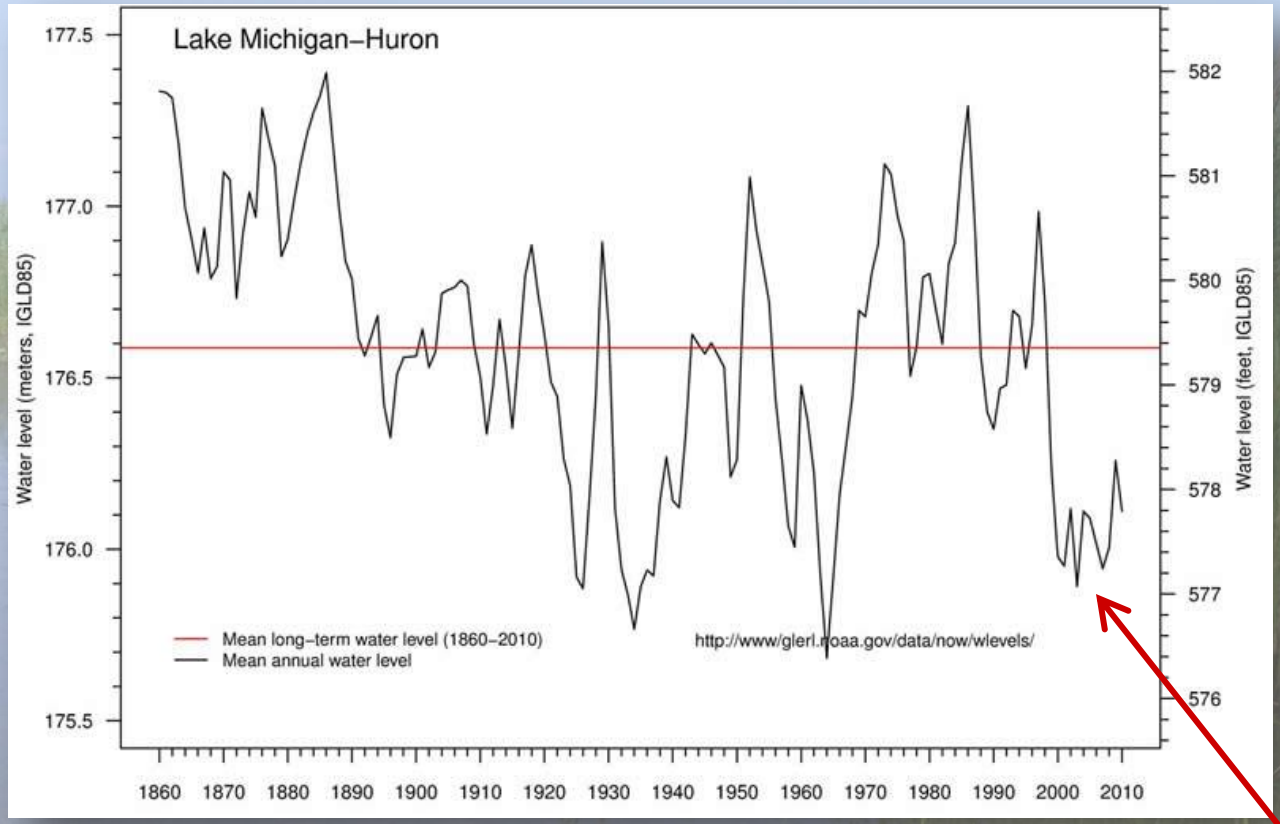
The vegetation of the marshes anchors sands of the beaches during high water periods, providing the most effective protection possible from the erosive impacts of the waves and ice of the Great Lakes.

32 species of Great Lakes fish depend upon coastal marshes for reproductive success.

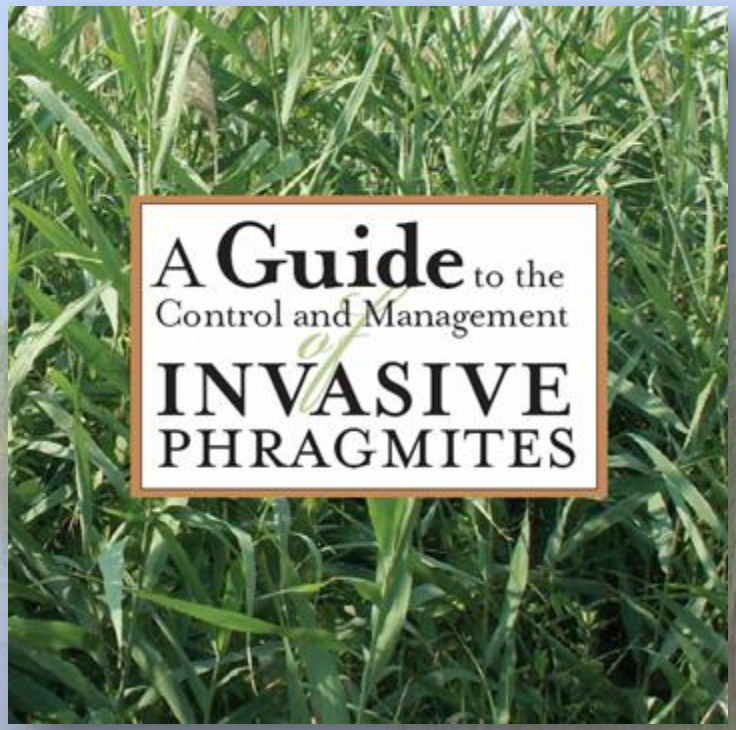
At least 41 state listed, threatened, and endangered species of animals depend upon wetlands at some point in their life cycle.

Background

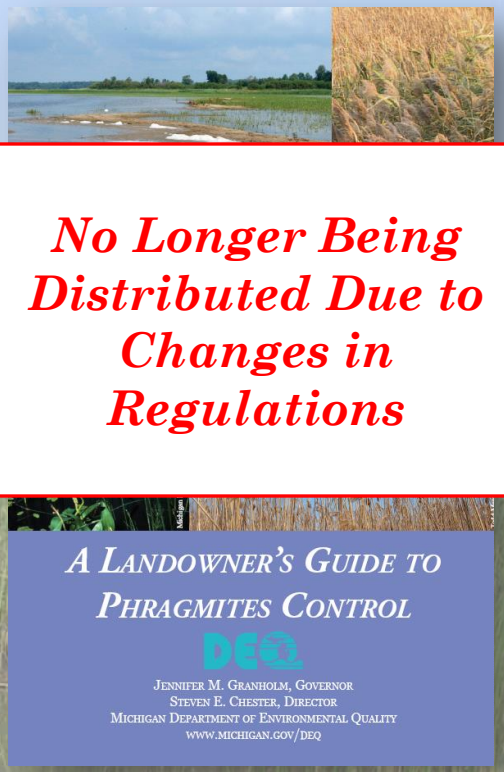
Great Lakes Water Level Fluctuations



Phragmites Educational Materials



(Comprehensive; 3rd Edition updates underway)



No Longer Being Distributed Due to Changes in Regulations

(Less comprehensive, focus on regulations)

Phragmites Management Recommendations

1. Chemical Treatment – Herbicide in late summer/early fall (Glyphosate and/or Imazapyr)

2. Mechanical Treatment – Moderate height (>6") in late fall/winter

    - Mowing is most common, easiest for private landowners
    - Prescribed fire – can be very effective, eliminates most of the thatch increasing sunlight penetration and stimulating growth of many native seeds in the soil
    - Flooding – water level control in dyked systems can also be very effective, but this technique is not feasible for most shoreline areas

3. Follow-Up Spot Treatment – Targeted herbicide application of re-growth sprouts is often necessary in subsequent years.

4. Monitoring – Vegetation monitoring can quickly identify *Phragmites* re-growth, or invasion of other opportunistic invasive species which often occurs following treatment (Narrow-leaf Cattail, Reed Canary Grass, etc.)

Phragmites Management Recommendations

Phragmites management so far…

Beginning in the early 2000's, with the low water levels, *Phragmites* management in Michigan has been significantly sporadic and patchy.

There has not been a strategic execution of managing *Phragmites* in a spatially effective manner – "checker-board" approach across the state, primarily driven by funding and coordination limitations.

Individual property owners have attempted management on individual lots, with or without coordination from adjacent property owners.

Land management groups (watershed groups, conservancies, etc.) have worked to manage *Phragmites* on a local or regional scale but are often limited by funding, personnel/equipment, and landowner permissions.

2011 – AIS Advisory Council

- The Aquatic Invasive Species Advisory Council was created in 2011
  - Part 414 to the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended
  - to provide recommendations aquatic invasive species issues.
  - 19 members representing regulated entities, citizen organizations, governmental agencies, academia, and citizen stakeholders

Sec. 41412.

The council shall review and provide recommendations on Phragmites australis control measures to the department and to the standing committees of the senate and house of representatives with primary jurisdiction relating to natural resources and the environment.

The AIS Advisory Council met between April 2012 – June 2013

- *Final Recommendations are currently being reviewed by the Governor and Legislature*

2011 – AIS Advisory Council

Phragmites discussions began…

Long-term, what are our expectations and hopes for successful management of *Phragmites* in Michigan?

Biocontrol

Biocontrol for Purple Loosestrife, researched and produced at Cornell University, was highly successful throughout Michigan and other Great Lakes States.

The current research underway on biocontrol for *Phragmites* is similar, and we are very hopeful that we will see similar results with *Phragmites*.

2011 – AIS Advisory Council

But, in the meantime…

Planning and Coordination

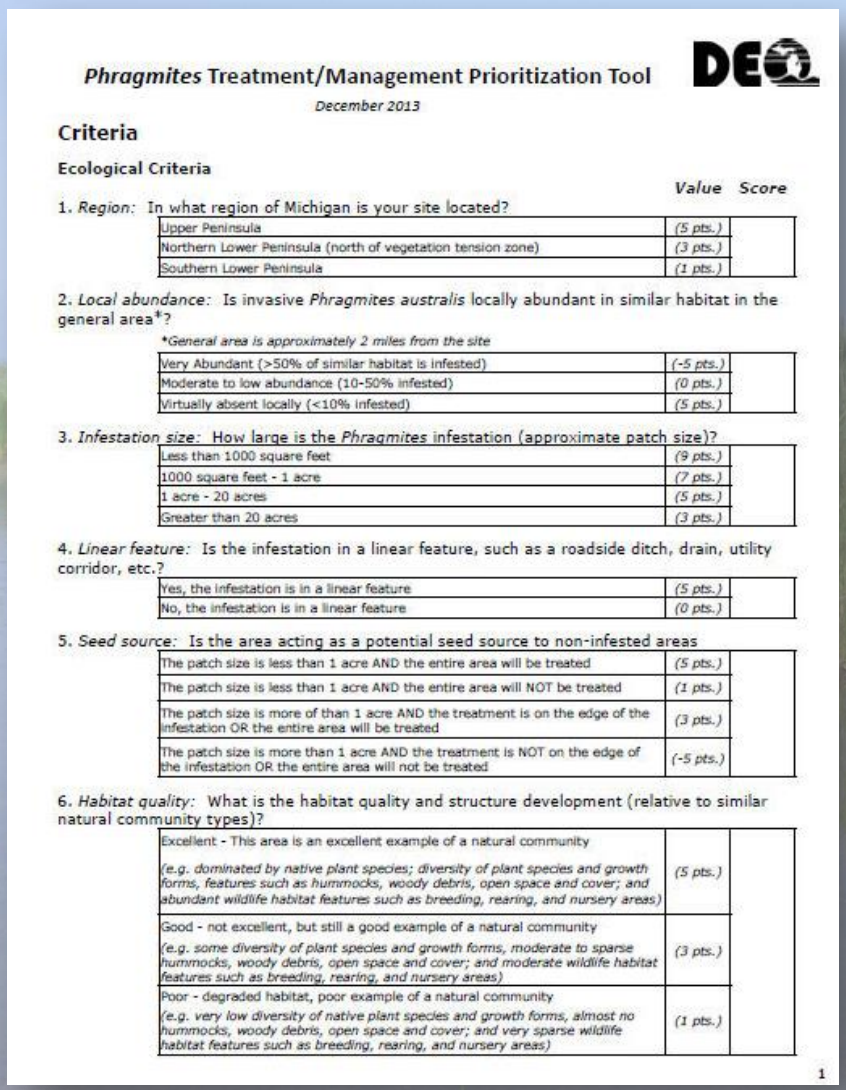
Research and Scientific Progress

Social Issues

GAP: Help the groups and public who are out there actually DOING Phragmites management, focus and prioritize their efforts.

- Targeting management sites, prioritizing efforts.

Phragmites Treatment/Management Prioritization Tool



***Phragmites* Treatment/Management Prioritization Tool**

December 2013

Criteria

Ecological Criteria

	Value	Score

1. *Region:* In what region of Michigan is your site located?

Upper Peninsula	*(5 pts.)*	
Northern Lower Peninsula (north of vegetation tension zone)	*(3 pts.)*	
Southern Lower Peninsula	*(1 pts.)*	

2. *Local abundance:* Is invasive *Phragmites australis* locally abundant in similar habitat in the general area*?

**General area is approximately 2 miles from the site*

Very Abundant (>50% of similar habitat is infested)	*(-5 pts.)*	
Moderate to low abundance (10-50% infested)	*(0 pts.)*	
Virtually absent locally (<10% infested)	*(5 pts.)*	

3. *Infestation size:* How large is the *Phragmites* infestation (approximate patch size)?

Less than 1000 square feet	*(9 pts.)*	
1000 square feet - 1 acre	*(7 pts.)*	
1 acre - 20 acres	*(5 pts.)*	
Greater than 20 acres	*(3 pts.)*	

4. *Linear feature:* Is the infestation in a linear feature, such as a roadside ditch, drain, utility corridor, etc.?

Yes, the infestation is in a linear feature	*(5 pts.)*	
No, the infestation is in a linear feature	*(0 pts.)*	

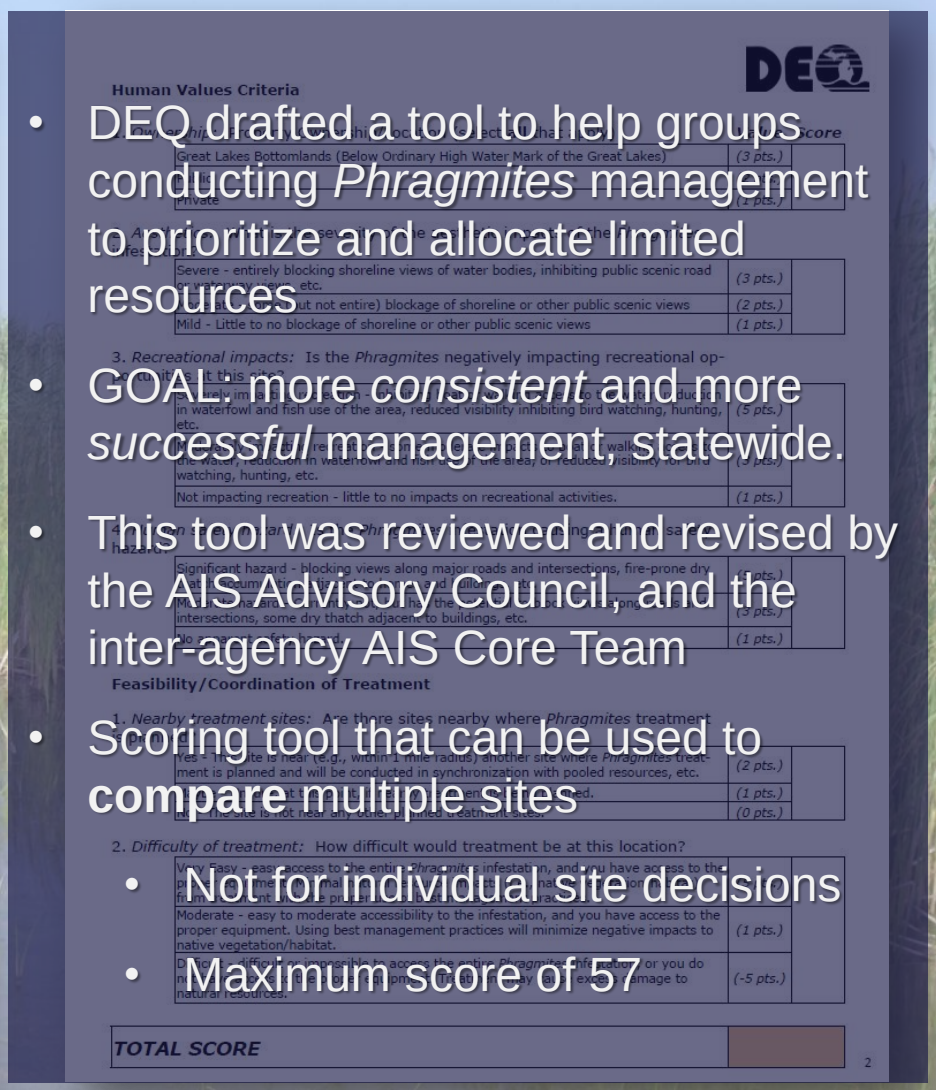
5. *Seed source:* Is the area acting as a potential seed source to non-infested areas

The patch size is less than 1 acre AND the entire area will be treated	*(5 pts.)*	
The patch size is less than 1 acre AND the entire area will NOT be treated	*(1 pts.)*	
The patch size is more of than 1 acre AND the treatment is on the edge of the infestation OR the entire area will be treated	*(3 pts.)*	
The patch size is more than 1 acre AND the treatment is NOT on the edge of the infestation OR the entire area will not be treated	*(-5 pts.)*	

6. *Habitat quality:* What is the habitat quality and structure development (relative to similar natural community types)?

Excellent - This area is an excellent example of a natural community *(e.g. dominated by native plant species; diversity of plant species and growth forms, features such as hummocks, woody debris, open space and cover; and abundant wildlife habitat features such as breeding, rearing, and nursery areas)*	*(5 pts.)*	
Good - not excellent, but still a good example of a natural community *(e.g. some diversity of plant species and growth forms, moderate to sparse hummocks, woody debris, open space and cover; and moderate wildlife habitat features such as breeding, rearing, and nursery areas)*	*(3 pts.)*	
Poor - degraded habitat, poor example of a natural community *(e.g. very low diversity of native plant species and growth forms, almost no hummocks, woody debris, open space and cover; and very sparse wildlife habitat features such as breeding, rearing, and nursery areas)*	*(1 pts.)*	

1



Human Values Criteria

Great Lakes Bottomlands (Below Ordinary High Water Mark of the Great Lakes)	*(3 pts.)*	
Private	*(1 pts.)*	
Severe - entirely blocking shoreline views of water bodies, inhibiting public scenic road etc.	*(3 pts.)*	
Moderate - (but not entire) blockage of shoreline or other public scenic views	*(2 pts.)*	
Mild - Little to no blockage of shoreline or other public scenic views	*(1 pts.)*	
Significant hazard - blocking views along major roads and intersections, fire-prone dry intersections, some dry thatch adjacent to buildings, etc.	*(5 pts.)*	
Not impacting recreation - little to no impacts on recreational activities.	*(1 pts.)*	

Feasibility/Coordination of Treatment

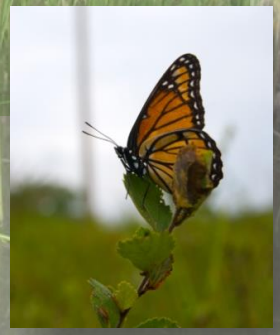
Yes - the site is near (e.g., within 1 mile radius) another site where *Phragmites* treatment is planned and will be conducted in synchronization with pooled resources, etc.	*(2 pts.)*	
Moderate - easy to moderate accessibility to the infestation, and you have access to the proper equipment. Using best management practices will minimize negative impacts to native vegetation/habitat.	*(1 pts.)*	
	(0 pts.)	
	(-5 pts.)	
TOTAL SCORE		

2

- DEQ drafted a tool to help groups conducting *Phragmites* management to prioritize and allocate limited resources
- GOAL: more *consistent* and more *successful* management, statewide.
- This tool was reviewed and revised by the AIS Advisory Council, and the inter-agency AIS Core Team
- Scoring tool that can be used to **compare** multiple sites
  - Not for individual site decisions
  - Maximum score of 57

Phragmites Treatment/Management Prioritization Tool

- Audience: Intended for land/resource management groups who are working on *Phragmites* management on a local or regional scale (local, regional and state land managers).
  - to compare many potential treatment sites, rank many sites and focus efforts on the highest priority locations first
  - to strategically allocate limited resources
  - guidance for determining which *Phragmites* populations to target within their management areas (e.g. watershed groups, land conservancies, cooperative weed management groups, municipalities, etc.)



Phragmites Treatment/Management Prioritization Tool

This tool was designed to help provide a method to *prioritize* treatment areas within local or regional target areas. Ideally, if this tool is used by groups all over the state, the effect will be more *consistent* and more *successful* management statewide.

The Phragmites Treatment/Management Prioritization tool uses three categories of criteria as factors to score and prioritize invasive *Phragmites* infestations for management:

- Ecological Criteria
- Human Values Criteria
- Feasibility/Coordination of treatment

Ecological Criteria

1. *Region:* In what region of Michigan is your site located?
   - In general, invasive *Phragmites* is more widespread and established in the southern region of Michigan, while the infestations are smaller and less established further north.
2. *Local abundance:* Is invasive *Phragmites australis* locally abundant in similar habitat in the general area*? (*General area is approximately 2 miles from the site)
   - Sites with fewer local infestations in similar habitats will score higher for this criterion, as the likelihood of treatment success and the prevention of spread are greater where infestations are not locally abundant.
3. *Infestation size:* How large is the *Phragmites* infestation (approximate patch size)?
   - More points are given to sites with smaller infestations, as the likelihood of successful management is greater in smaller infestations.

Ecological Criteria

4. *Linear feature:* Is the infestation in a linear feature, such as a roadside ditch, drain, utility corridor, etc.?
   - Linear features act as a conduit for the rhizomal spread of *Phragmites*, and prioritizes the management of these features.
5. *Seed Source:* Is the area acting as a potential seed source to non-infested areas?
   - Ranks sites based on the probability that the site could act as a source of spread through seed dispersal, even after treatment. The probability that the entire infestation will be successfully managed is greater on sites where both the total patch size is smaller, and the entire area will be treated, thereby reducing the likelihood of spread.

Ecological Criteria

6. *Habitat Quality:* What is the habitat quality and structure development (relative to similar natural community types)?
   - Compare characteristics of the site habitat relative to similar natural communities - should have some ecological knowledge of the type of natural communities found throughout Michigan. Example considerations:

- dominance and diversity of native plant species.
- variation in plant growth forms (trees, shrubs, herbaceous).
- habitat features like hummocks, woody debris, open space and cover.
- fish, wildlife, and waterfowl breeding, rearing, and nursery areas.

Human Values Criteria

1. *Ownership:* Property Ownership/Location
   - Ownership status (public/private) can influence the public benefits derived from a site.
2. *Aesthetics:* What is the severity of the aesthetic impacts of the *Phragmites* infestation?
   - Invasive *Phragmites* stands can block shoreline views of water bodies, inhibit scenic roads and waterways views, etc.
3. *Recreational impacts:* Is the *Phragmites* negatively impacting recreational opportunities at this site?
   - Dense infestations can severely inhibit boating, walking, swimming, and hunting access to water bodies, reduce waterfowl and fish use in an area, and reduce visibility for bird watching, hunting, and fishing, etc.

Human Values Criteria

4. *Human safety hazard:* Is the *Phragmites* infestation causing a human safety hazard?
   - Very rare instances where infestations can cause a potential human safety hazard. (Most sites are ranked as "no apparent safety hazard".) Some examples of unique human safety hazard situations include:
     - *Phragmites* infestation so tall and dense that it is physically blocking views at busy road intersections, potentially causing traffic accidents.
     - Large accumulations of fire-prone dry *Phragmites* thatch accumulated directly adjacent to homes or buildings (not just near buildings, but where the thatch is potentially a fire hazard to the building itself), etc.

Feasibility/Coordination Criteria

1. *Nearby Treatment Sites:* Are there sites nearby where *Phragmites* treatment is planned?
   - Strategically maximize time and resources, encourage the management of sites with similar treatment methods and equipment requirements, within approximately 1 mile of each other.

Feasibility/Coordination Criteria

2. *Difficulty of Treatment:* How difficult would treatment be at this location?
   - Some sites would be so challenging to effectively manage, that the amount of resources spent on it would be extreme, overdrawing the limited funding or staff time *thus* preventing a group from treating other high priority sites. In some of these situations, consider prioritizing other high/moderate priority sites which are easier to treat. Some of the considerations for this criteria include:

- Can you access the infestation on foot, need an amphibious vehicle or a helicopter? Can you easily acquire this vehicle, or would you need to acquire additional funds?
- Do you have access to the proper equipment? Aerial applicator, backpack or wicking unit? Do you have a mower capable of mowing the tall/dense infestation, or the inundated infestation?
- Are there threatened/endangered species, or rare and imperiled communities, that could potentially be impacted by the treatment? Are there migratory or nesting birds within the infestation? Do you have the means to identify and avoid these impacts?

Example Site A

	Score
	3
	0
	7
	0
eated	5
	3
	4
	1
	3
	1
	1
	5
TOTAL SCORE	**33**

Example Site B

Selection	Score
ower	1
dant	-5
Human Safety Hazard	
Feasibility/Coordination Criteria	
Nearby Treatment Sites	
Difficulty of Treatment	
TOTAL SCORE	**5**

Example Sites

	Selection	Score
Ecological Criteria		
Region	Northern Lower	3
Local Abundance	Moderate - Low	0
Infestation Size	1000 sq. ft. - 1 ac.	7
Linear Feature	No	0
Seed Source	Patch < 1 ac. AND entire area will be treated	5
Habitat Quality	Good	3
Human Values Criteria		
Ownership	GL Bottomlands & Private	4
Aesthetics	Mild	1
Recreational Impacts	Moderate	3
Human Safety Hazard	None	1
Feasibility/Coordination Criteria		
Nearby Treatment Sites	Maybe	1
Difficulty of Treatment	Very Easy	5
TOTAL SCORE		**33**

Example Site A
Higher Likelihood of Success
Less Strain on Resources (funding, personnel, equipment)

	Selection	Score
Ecological Criteria		
Region	Southern Lower	1
Local Abundance	Very Abundant	-5
Infestation Size	> 20 ac.	3
Linear Feature	No	0
Seed Source	Patch > 1 ac. AND entire area will not be treated	-5
Habitat Quality	Poor	1
Human Values Criteria		
Ownership	GL Bottomlands & Public	5
Aesthetics	Severe	3
Recreational Impacts	Severe	5
Human Safety Hazard	None	1
Feasibility/Coordination Criteria		
Nearby Treatment Sites	Maybe	1
Difficulty of Treatment	Difficult	-5
TOTAL SCORE		**5**

Example Site B
Lower Likelihood of Success
Greater Strain on Resources (funding personnel, equipment)

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Aquatic Invasive Species

This page can be accessed as www.mi.gov/aquaticinvasives.

Michigan's aquatic ecosystems are experiencing significant negative effects from aquatic invasive species (AIS) that are already present, and the state's waters are continually threatened by new invasions. The most widely used definition of invasive species that is derived directly from the National Invasive Species Council is as follows:

"An invasive species is defined as a species that is not native and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health."

The introduction of AIS into the Great Lakes and inland state waters is a source of biological pollution that has significant negative effects on natural resources, human health, recreational opportunities, and other human values throughout the state and region. AIS may compete with native species for food and habitat. AIS can also have significant economic effects on waterfront property values, tourism, utilities, and other industries. Michigan Department of Environmental Quality is gaining momentum and has the expertise and dedicated citizens and partners to be a frontrunner in the fight against AIS.

REPORT AN INVASIVE SPECIES

AIS News

- Aquatic Invasive Species (AIS) of the Week
- Asian Carp Exploration - Shedd Aquarium's new curriculum for students
- High Stakes of the Great Lakes - Shedd Aquarium videos that focus on the threat of Asian carp!
- Press Release: DNR Responds to New Aquatic Invader (European frogbit)

Michigan's AIS Program

- AIS Advisory Council
- AIS Program Bulletin for 2013 PDF
- AIS Program Overview
- Contacts for Invasive Species Information in Michigan PDF
- Michigan's AIS Watch List - Reporting Priority AIS PDF
- Michigan's Aquatic Invasive Species State Management Plan
- Video: Sarah LeSage talks about Michigan's AIS Program

Michigan's Goals for AIS Management

- Preventing New Introductions & Limiting the Spread
- AIS Detection & Monitoring
- AIS Management & Control
- AIS Outreach and Education Efforts and Resources
- Laws, Policies & Legislation Concerning Invasive Species
- Angler's Monitoring Network
- Cleaning Boats and Equipment to Prevent AIS

Hot Topics

Quick Links
- Great Lakes Panel on Aquatic Nuisance Species
- Federal Task Force on Aquatic Nuisance Species
- NOAA Great Lakes Environmental Research Laboratory
- Michigan Sea Grant

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Phragmites

This website can be accessed at www.michigan.gov/aquaticinvasives.

Photo Credit: Michigan Sea Grant

Phragmites australis (frag-MY-teez), also known as common reed, is a perennial, wetland grass that can grow to 15 feet in height. While Phragmites australis is native to Michigan, an invasive, non-native, variety of phragmites is becoming widespread and is threatening the ecological health of wetlands and the Great Lakes coastal shoreline. Invasive phragmites creates tall, dense stands which degrade wetlands and coastal areas by crowding out native plants and animals, blocking shoreline views, reducing access for swimming, fishing, and hunting and can create fire hazards from dry plant material.

Invasive Phragmites can be controlled using an integrated pest management approach which includes an initial herbicide treatment followed by mechanical removal (e.g., cutting, mowing) and annual maintenance. For large areas with dense stands of invasive Phragmites, prescribed burning used after herbicide treatment can provide additional control and ecological benefits over mechanical removal. Early detection is key to preventing large dense stands and is also more cost efficient.

Great Lakes basin wide Phragmites information through the **Great Lakes Phragmites Collaborative (GLPC)** is available at: http://greatlakesphragmites.net/. The GLPC is a regional partnership established to improve communication and collaboration and lead to more coordinated, efficient and strategic approaches to *Phragmites* management, restoration and research across the Great Lakes basin.

Phragmites Prioritization Tool

The DEQ has developed a prioritization tool and user guide to help management groups prioritize the treatment and management of invasive Phragmites in Michigan. A user guide is also available that gives more details about how to use the tool and describes the criteria used for prioritization. Note – There are two slightly different versions of the tool; one for printing and filling in by hand and another for filling in electronically. With Adobe Reader XI, you can also save a file with the filled in information.

- Phragmites Treatment/Management Prioritization Tool – Printable Version
- Phragmites Treatment/Management Prioritization Tool – Fill-in Version
- User Guide for the Phragmites Treatment/Management Prioritization Tool

What You Can Do

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Phragmites Treatment/Management Prioritization Tool

www.mi.gov/aquaticinvasives

Click "Phragmites"

Information on Michigan's rare species and communities can be found at the Michigan Natural Features Inventory website here: http://mnfi.anr.msu.edu/